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EXAMINER	
STAICOVICI, STEFAN	

ART UNIT	PAPER NUMBER
1732	

DATE MAILED: 12/03/2003

11

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

YB

Office Action Summary	Application No.	Applicant(s)
	10/073,407	MEGGIOLAN, MARIO
	Examiner	**Art Unit**
	Stefan Staicovici	1732

-- The MAILING DATE of this c mmunication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 September 2003*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-44* is/are pending in the application.

4a) Of the above claim(s) *32-39* is/are withdrawn from consideration.

5)☒ Claim(s) *41-44* is/are allowed.

6)☒ Claim(s) *1-12, 17-31, 40* is/are rejected.

7)☒ Claim(s) *13-16* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: .

DETAILED ACTION

Response to Amendment

1. Applicant's amendment filed September 17, 2003 (Paper No. 10) has been entered. Claims 1, 4, 9-15, 17, 19, 24-25 and 40 have been amended. New claims 41-44 have been added. No claims have been added. Claims 1-44 are pending in the instant application.

Election/Restrictions

2. This application contains claims 32-39 drawn to an invention nonelected with traverse in Paper No. 6. A complete reply to the final rejection must include cancellation of nonelected claims or other appropriate action (37 CFR 1.144) See MPEP § 821.01.

Claim Rejections - 35 USC § 112

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-2, 11, 20-31 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The newly added limitation in claim 1 of an expandable core "having a reusable inner body" is unclear in relationship to the limitations of subsequent claims 2, 11 and 20-31, because Applicant refers in these subsequent claims to "the core" without differentiating between the expandable sheath and the inner reusable body. It should be noted that for the purpose of

examination it has been assumed that "an expandable core having a inner reusable body" is a core having a "expandable sheath" and a "reusable inner body". Further clarification is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-2, 4-11, 17-18, 20-25 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Castanie *et al.* (US Patent No. 6,290,889 B1) in view of Nelson *et al.* (US Patent No. 6,340,509 B1).

Castanie *et al.* ('889 B1) teach the basic claimed process for making a composite article including, providing an expandable core including a reusable metallic body (11) covered by an elastomeric layer (10), wrapping a plurality of resin pre-impregnated fiber reinforcement layers (15) to form a wrapped assembly (layered outer body), placing said wrapped assembly in a mold (20), increasing temperature of said mold to cure said resin and form said molded composite article and, removing said reusable metallic core from said molded composite article (see col. 6, lines 39-64 and col. 7, line 46). Further, Castanie *et al.* ('889 B1) teach expansion of said elastomeric layer (10) (see col. 7, lines 29-31).

Regarding claim 1, although Castanie *et al.* ('889 B1) teach a hollow composite article, Castanie *et al.* ('889 B1) do not teach a bicycle connector element. Nelson *et al.* ('509) teach a process of molding a connector element for a bicycle frame including, providing a mandrel core

(225), covering said mandrel core (225) with a bladder (227) to form an expandable core (241), wrapping said expandable core (241) with resin pre-impregnated fiber reinforced plies/performs to form a wrapped assembly (242), placing said wrapped assembly (242) into a mold cavity defined by a top mold half (245) and a bottom mold half (243), expanding said expandable core (241) to compact said plies/performs against said cavity, heat said mold to cure said resin and form said connector element for a bicycle frame removing said molded connector element for a bicycle frame (see col. 10, line 63 through col. 11, line 18; col. 11, line 62 through col. 12, line 16; col. 13, lines 14-23 and 55-65; col. 14, lines 1-15; col. 14, line 62 through col. 15, line 15 and col. 16, lines 20-50). Therefore, it would have been obvious for one of ordinary skill in the art to have formed a bicycle connector element as taught by Nelson *et al.* ('509) using the process of Castanie *et al.* ('889 B1) because, Nelson *et al.* ('509) specifically teach that a bicycle connector element is a hollow composite article, whereas Castanie *et al.* ('889 B1) teach a more efficient process for forming any hollow composite article by producing accurate internal surfaces and also because, both references teach similar processes and materials.

In regard to claim 2, Castanie *et al.* ('889 B1) teach that expansion of said elastomeric layer (10) occurs due to an increase in temperature (see col. 7, lines 29-31), hence it is submitted that expansion and heating of said mold occur simultaneously.

Specifically regarding claims 4-5, Castanie *et al.* ('889 B1) teach a polyimide (thermosetting) pre-impregnated carbon fiber material (see col. 6, lines 29-35).

Regarding claim 6, Castanie *et al.* ('889 B1) do not teach a curing temperature in the range of 80-200°C. However, Castanie *et al.* ('889 B1) teach that said curing temperature is dependent on the resin used. Further, Nelson *et al.* ('509) teach that said curing temperature of an

epoxy resin is about 300 °F (col. 16, lines 5-10). As such, it is submitted that said curing temperature is a result-effective variable. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977). Therefore, it would have been obvious for one of ordinary skill in the art to have used routine experimentation to determine an optimum curing temperature in the range of 80-200°C in the process of Castanie *et al.* ('889 B1) in view of Nelson *et al.* ('509) because, both Castanie *et al.* ('889 B1) and Nelson *et al.* ('509) teach that said curing temperature is a result-effective variable.

In regard to claims 7-8, Castanie *et al.* ('889 B1) in view of Nelson *et al.* ('509) do not teach a specific molding time. However, Nelson *et al.* ('509) teach that the pressure time, the amount of pressure and the time and extent of the heating of the mold are process variables that are optimized. Hence, it is submitted that the heating time is a result-effective variable because it is optimized and also because it determines the curing of the resin (see col. 15, lines 26-38). In re Anonie, 559F.2d 618, 195 USPQ 6 (CCPA 1977). Therefore, it would have been obvious for one of ordinary skill in the art to have used routine experimentation to determine an optimum heating time ranging from 10 minutes to 3 hours in the process of Castanie *et al.* ('889 B1) in view of Nelson *et al.* ('509) because, Nelson *et al.* ('509) specifically teach that the heating time is a result-effective variable and also because the heating time is determined by the type of resin used.

Specifically regarding claim 9, Castanie *et al.* ('889) teach a metallic inner body (11) (see col. 5, lines 35-40).

Regarding claims 10-11 and 24-25, Castanie *et al.* ('889) teach a silicone elastomer having a thermal dilation coefficient of 40×10^{-5} 1/°C and a disintegration temperature of 290 °C.

In regard to claims 12, 17-18 and 28 although Castanie *et al.* ('889 B1) teach a process for forming any hollow composite article, Castanie *et al.* ('889 B1) do not teach a hollow composite article having a main cylindrical portion and separate one or more auxiliary cylindrical branches. However, Nelson *et al.* ('509) teach a composite hollow article having a main cylindrical portion and one or more auxiliary cylindrical branches. Further, Nelson *et al.* ('509) teach providing an expandable core having an expandable bladder (227) covering said core by stretching, said core including a cylindrical main body and branches extending from said main cylindrical body (see Figure 7A). Castanie *et al.* ('889) teach a molding process including, providing an expandable core including a metallic body (11) covered by an elastomeric layer (10), wrapping a plurality of resin pre-impregnated fiber reinforcement layers (15) to form a wrapped assembly, placing said wrapped assembly in a mold (20) and curing said resin to form a molded article (see col. 5, lines 36-56). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a core and elastomeric material having a cylindrical main body and branches extending from said main cylindrical body as taught by Nelson *et al.* ('509) as the expandable core and inner body in the process of Castanie *et al.* ('889) because, Nelson *et al.* ('509) specifically teach that a bicycle connector element is a hollow composite article, whereas Castanie *et al.* ('889 B1) teach a more efficient process for forming any hollow composite article by producing accurate internal surfaces and also because, both references teach similar processes and materials. It is submitted that the core in the process of Castanie *et al.* ('889) in view of Nelson *et al.* ('509) must include a metallic cylindrical main body and branches extending from said main cylindrical body in order for the invention of Castanie *et al.* ('889) in view of Nelson *et al.* ('509) to function as described.

Specifically regarding claim 20, Castanie *et al.* ('889) teach a plurality of resin pre-impregnated layers (see col. 5, lines 47-50).

Regarding claims 21-23, Nelson *et al.* ('509) teach wrapping said expandable core with a plurality of plies/performs that extend around the expandable core (see Figure 11) such as to fully cover said core. Furthermore, Nelson *et al.* ('509) teach reinforcing high stress areas by placing additional plies/preforms at said areas (enlarged diameter and increases thickness at selected locations) (see col. 13, lines 14-54) while accommodating said branches extending from said main cylindrical body. Therefore, it would have been obvious for one of ordinary skill in the art to have provided a core and elastomeric material having a cylindrical main body and branches extending from said main cylindrical body and, wrapping said core as taught by Nelson *et al.* ('509) in the process of Castanie *et al.* ('889) because, Nelson *et al.* ('509) specifically teach that a bicycle connector element is a hollow composite article, whereas Castanie *et al.* ('889 B1) teach a more efficient process for forming any hollow composite article by producing accurate internal surfaces and also because, both references teach similar processes and materials. It is submitted that the core in the process of Castanie *et al.* ('889) in view of Nelson *et al.* ('509) must include a metallic cylindrical main body and branches extending from said main cylindrical body and as such must be wrapped with a plurality of plies/performs that extend around the expandable core such as to fully cover said core in order for the invention of Castanie *et al.* ('889) in view of Nelson *et al.* ('509) to function as described.

7. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Castanie *et al.* (US Patent No. 6,290,889 B1) in view of Nelson *et al.* (US Patent No. 6,340,509 B1) and in further view of Nelson *et al.* (US Patent No. 5,534,203).

Castanie *et al.* ('889 B1) in view of Nelson *et al.* ('509) teach the basic claimed process as described above.

Regarding claim 3, Castanie *et al.* ('889 B1) in view of Nelson *et al.* ('509) do not teach cooling of the mold. Nelson *et al.* ('203) teach that that removing the molded object after the mold has been cooled is an equivalent alternative to removing the molded object from the mold when the mold is still hot (see col. 25, lines 27-29). Therefore, it would have been obvious for one of ordinary skill in the art to have cooled the mold first before removing the molded article as taught by Nelson *et al.* ('203) in the process of Castanie *et al.* ('889 B1) in view of Nelson *et al.* ('509) because, Nelson *et al.* ('203) specifically teach that removing the molded object after the mold has been cooled is an equivalent alternative to removing the molded object from the mold when the mold is still hot and also because, by removing the molded object after cooling the mold safety requirements are less stringent and work accidents are less likely to occur. Further, it should be noted that Nelson *et al.* ('509) teach a mold having cooling lines (see col. 15, lines 47-48), hence suggesting cooling of the mold.

8. Claims 1, 30 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buxton *et al.* (US Patent No. 4,683,099) in view of Nelson *et al.* (US Patent No. 6,340,509 B1).

Buxton *et al.* ('099) teach the basic claimed process including, providing a reusable expandable mold (10) (reusable inner body), applying a plurality of resin pre-impregnated fiber reinforced plies (11) about said reusable expandable mandrel (10) to form a wrapped assembly, placing said wrapped assembly in a mold cavity (13), increasing the temperature of the mold such that the mandrel (10) expands and compresses said resin pre-impregnated fiber reinforced

plies (11) against said mold cavity (13), curing of the resin and removing said expandable mandrel (10) so as to obtain a hollow tube (see col. 2, lines 4-66 and Figure 1).

Regarding claims 1 and 30, although Buxton *et al.* ('099) teach a hollow composite article, Buxton *et al.* ('099) does not specifically teach a connector element for a bicycle frame. Nelson *et al.* ('509) teach a process of molding a connector element for a bicycle frame including, providing a mandrel core (225), covering said mandrel core (225) with a bladder (227) to form an expandable core (241), wrapping said expandable core (241) with resin pre-impregnated fiber reinforced plies/performs to form a wrapped assembly (242), placing said wrapped assembly (242) into a mold cavity defined by a top mold half (245) and a bottom mold half (243), expanding said expandable core (241) to compact said plies/performs against said cavity, heat said mold to cure said resin and form said connector element for a bicycle frame removing said molded connector element for a bicycle frame (see col. 10, line 63 through col. 11, line 18; col. 11, line 62 through col. 12, line 16; col. 13, lines 14-23 and 55-65; col. 14, lines 1-15; col. 14, line 62 through col. 15, line 15 and col. 16, lines 20-50). Therefore, it would have been obvious for one of ordinary skill in the art to have molded a connector element for a bicycle frame as taught by Nelson *et al.* ('509) by the process of Buxton *et al.* ('099) because, Buxton *et al.* ('099) teach a process for making any hollow composite article, whereas Nelson *et al.* ('509) teach that a connector element for a bicycle frame is a hollow composite article and also because, Buxton *et al.* ('099) specifically teach that the expandable mandrel of its process provides an improved molded article over a silicone rubber expansion molding method which is taught by the process of Nelson *et al.* ('509) (see col. 1, lines 23-30 of Buxton *et al.* ('099)).

Specifically regarding claim 40, Buxton *et al.* ('099) teach radial expansion of said expandable core (10).

9. Claims 24-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Buxton *et al.* (US Patent No. 4,683,099) in view of Nelson *et al.* (US Patent No. 6,340,509 B1) and in further view of Miller *et al.* (US Patent no. 4,039,490).

Buxton *et al.* ('099) in view of Nelson *et al.* ('509) teach the basic claimed process as described above.

Regarding claims 24 and 25, although Buxton *et al.* ('099) teach that Teflon has a continuous temperature resistance of up to 330 °C, the process of Buxton *et al.* ('099) in view of Nelson *et al.* ('509) do not teach a specific thermal dilation coefficient. Miller *et al.* ('490) teach that the thermal dilation coefficient of Teflon is $12x10^{-5}$ 1/°C (see col. 2, lines 53-55). Therefore, it would have been obvious for one of ordinary skill in the art to have provided a Teflon material having a thermal dilation coefficient of $12x10^{-5}$ 1/°C as taught by Miller *et al.* ('490) in the process of Buxton *et al.* ('099) in view of Nelson *et al.* ('509) because, Buxton *et al.* ('099) specifically teach the use of Teflon as an expandable mandrel, whereas Miller *et al.* ('490) teach that the thermal dilation coefficient of Teflon is $12x10^{-5}$ 1/°C.

In regard to claims 26 and 27, Buxton *et al.* ('099) specifically teach the use of Teflon as an expandable mandrel (10) (see col. 2, lines 4-5).

10. Claims 1, 29-31 and 40 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 57-210820 in view of Nelson *et al.* (US Patent No. 6,340,509 B1).

JP 57-210820 teaches the basic claimed process including, providing an expandable mold having a main body (4) and a plurality of movable sectors (3) (reusable inner body), applying a

plurality of resin pre-impregnated fiber reinforced plies (1) about said expandable sectors (3) to form a wrapped assembly, expanding said expandable sectors (3), curing said resin pre-impregnated fiber reinforced plies (1) and removing said expandable mandrel (10) so as to obtain a hollow tube (see Abstract).

Regarding claim 1 and 30-31, JP 57-210820 does not teach curing in a mold cavity. Nelson *et al.* ('509) teach a process of molding a connector element for a bicycle frame including, providing a mandrel core (225), covering said mandrel core (225) with a bladder (227) to form an expandable core (241), wrapping said expandable core (241) with resin pre-impregnated fiber reinforced plies/performs to form a wrapped assembly (242), placing said wrapped assembly (242) into a mold cavity defined by a top mold half (245) and a bottom mold half (243), expanding said expandable core (241) to compact said plies/performs against said cavity, heat said mold to cure said resin and form said connector element for a bicycle frame removing said molded connector element for a bicycle frame (see col. 10, line 63 through col. 11, line 18; col. 11, line 62 through col. 12, line 16; col. 13, lines 14-23 and 55-65; col. 14, lines 1-15; col. 14, line 62 through col. 15, line 15 and col. 16, lines 20-50). Therefore, it would have been obvious for one of ordinary skill in the art to have molded a connector element for a bicycle frame as taught by Nelson *et al.* ('509) by the process of JP 57-210820 because, JP 57-210820 teach a process for molding an hollow composite article, whereas Nelson *et al.* ('509) teach that a connector element for a bicycle frame is a hollow composite article and also because, Nelson *et al.* ('509) specifically teach that a mold cavity provides the external shape of said molded connector element for a bicycle frame (see col. 8, lines 58-63 of Nelson *et al.* ('509)), hence assuring for improved dimensional tolerances.

In regard to claim 29, JP 57-210820 teaches an expandable mold having a main body (4) and a plurality of movable sectors (3) that force a plurality of resin pre-impregnated fiber reinforced plies in a radial direction by using adjusting mechanism (7) (see Figures 2 and 3A).

Specifically regarding claim 40, JP 57-210820 teaches radial expansion of said expandable core (3) and as such teaches radial pressure.

11. Claims 1, 4-6, 9-12, 17-25 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson *et al.* (US Patent No. 6,340,509 B1) in view of Castanie *et al.* (US Patent No. 6,290,889 B1).

Nelson *et al.* ('509) teach the claimed process of molding a connector element for a bicycle frame including, providing a mandrel core (225), covering said mandrel core (225) with a bladder (227) to form an expandable core (241), wrapping said expandable core (241) with resin pre-impregnated fiber reinforced plies/performs to form a wrapped assembly (242) (layered outer body), placing said wrapped assembly (242) into a mold cavity defined by a top mold half (245) and a bottom mold half (243), expanding said expandable core (241) to compact said plies/performs against said cavity, heating said mold to cure said resin and form said connector element for a bicycle frame and, removing said molded connector element for a bicycle frame (see col. 10, line 63 through col. 11, line 18; col. 11, line 62 through col. 12, line 16; col. 13, lines 14-23 and 55-65; col. 14, lines 1-15; col. 14, line 62 through col. 15, line 15 and col. 16, lines 20-50).

Regarding claims 1 and 9, Nelson *et al.* ('509) do not teach an expandable core having a metallic reusable inner body. Castanie *et al.* ('889 B1) teach the basic claimed process for making a composite article including, providing an expandable core including a reusable metallic

inner body (11) covered by an elastomeric layer (10), wrapping a plurality of resin pre-impregnated fiber reinforcement layers (15) to form a wrapped assembly (layered outer body), placing said wrapped assembly in a mold (20), increasing temperature of said mold to cure said resin and form said molded composite article and, removing said reusable inner metallic body from said molded composite article (see col. 6, lines 39-64 and col. 7, line 46). Further, Castanie *et al.* ('889 B1) teach expansion of said elastomeric layer (10) (see col. 7, lines 29-31). Therefore, it would have been obvious for one of ordinary skill in the art to have provided an inner reusable metallic core (body) as taught by Castanie *et al.* ('889) in the process of Nelson *et al.* ('509) because, Castanie *et al.* ('889) specifically teach that an inner core provides for an improved molded article by producing accurate internal surfaces and allows for a simplified removal of the core after molding (see col. 2, lines 37-43).

In regard to claims 4-6, Nelson *et al.* ('509) teach an epoxy (thermosetting) pre-impregnated carbon fiber material (see col. 13, lines 33-37) that cures at a temperature of about 300 °F (150 °C) (see col. 16, lines 5-10).

Specifically regarding claims 10-11, although Nelson *et al.* ('509) teach an elastomeric material, Nelson *et al.* ('509) do not teach a specific elastomeric material having a specific thermal dilation coefficient. Castanie *et al.* ('889) teach a silicone elastomer having a thermal dilation coefficient of 40×10^{-5} 1/°C and a disintegration temperature of 290 °C. Therefore, it would have been obvious for one of ordinary skill to have provided an expandable core including a metallic body covered by an elastomeric layer having a thermal dilation coefficient of 40×10^{-5} 1/°C and a disintegration temperature of 290 °C as taught by Castanie *et al.* ('889) in the process of Nelson *et al.* ('509) because, Castanie *et al.* ('889) specifically teach that such a core provides

for an improved molded article by producing accurate internal surfaces and allows for a simplified removal of the core after molding (see col. 2, lines 37-43).

Specifically regarding claims 12 and 17-19, Nelson *et al.* ('509) do not teach an expandable core having a metallic body covered by an elastomeric material, wherein said metallic body includes a main cylindrical portion and one or more auxiliary cylindrical branches extending from the main portion and wherein said elastomeric material follows the shape of said core by stretching. However, Nelson *et al.* ('509) teach an expandable core having an expandable bladder (227) covering a core by stretching, said core including a cylindrical main body and branches extending from said main cylindrical body (see Figure 7A). Castanie *et al.* ('889) teach a molding process including, providing an expandable core including a metallic body (11) covered by an elastomeric layer (10), wrapping a plurality of resin pre-impregnated fiber reinforcement layers (15) to form a wrapped assembly, placing said wrapped assembly in a mold (20) and curing said resin to form a molded article (see col. 5, lines 36-56). Therefore, it would have been obvious for one of ordinary skill in the art to have provided an expandable core including a metallic body covered by an elastomeric layer by stretching as taught by Castanie *et al.* ('889) in the process of Nelson *et al.* ('509) because, Castanie *et al.* ('889) specifically teach that such a core provides for an improved molded article by producing accurate internal surfaces and allows for a simplified removal of the core after molding (see col. 2, lines 37-43). It is submitted that the core in the process of Nelson *et al.* ('509) in view of Castanie *et al.* ('889) must include a metallic cylindrical main body and branches extending from said main cylindrical body in order for the invention of Nelson *et al.* ('509) in view of Castanie *et al.* ('889) to

function as described. Further, it should be noted that Nelson *et al.* ('509) teach removing said expandable bladder (227) from the molded article.

Regarding claims 20-23, Nelson *et al.* ('509) teach wrapping said expandable core with a plurality of plies/performs that extend around the expandable core (see Figure 11) such as to fully cover said core. Furthermore, Nelson *et al.* ('509) teach reinforcing high stress areas by placing additional plies/preforms at said areas (enlarged diameter and increases thickness at selected locations) (see col. 13, lines 14-54) while accommodating said branches extending from said main cylindrical body.

In regard to claims 24-25, although Nelson *et al.* ('509) teach a silicone material (col. 12, lines 15-16) Nelson *et al.* ('509) do not teach a specific silicone elastomeric material having a specific thermal dilation coefficient and a specific disintegration temperature. Castanie *et al.* ('889) teach a silicone elastomer having a thermal dilation coefficient of $40x10^{-5}$ 1/°C and a disintegration temperature of 290 °C. Therefore, it would have been obvious for one of ordinary skill to have provided an expandable core including a metallic body covered by an elastomeric layer having a thermal dilation coefficient of $40x10^{-5}$ 1/°C and a disintegration temperature of 290 °C as taught by Castanie *et al.* ('889) in the process of Nelson *et al.* ('509) because, Castanie *et al.* ('889) specifically teach that such a core provides for an improved molded article by producing accurate internal surfaces and allows for a simplified removal of the core after molding (see col. 2, lines 37-43) and also because Nelson *et al.* ('509) specifically teach a silicone material.

Specifically regarding claim 28, Nelson *et al.* ('509) teach an expandable core having an expandable bladder (227) covering a core, said core including a cylindrical main body and *separate* branches extending from said main cylindrical body (see Figure 7A).

12. Claims 2-3 and 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nelson *et al.* (US Patent No. 6,340,509 B1) in view of Castanie *et al.* (US Patent No. 6,290,889 B1) and in further view of Nelson *et al.* (US Patent No. 5,534,203).

Nelson *et al.* ('509) in view of Castanie *et al.* ('889) teach the basic claimed process as described above.

Regarding claim 2, Nelson *et al.* ('509) in view of Castanie *et al.* ('889) do not teach that expansion of said expandable core and heating of said mold occurs simultaneously. Nelson *et al.* ('203) teach a molding process using an expandable core that is expanded simultaneously with heating of a mold (see col. 25, lines 1-15). Therefore, it would have been obvious for one of ordinary skill in the art to have simultaneously heated the mold and expanded the core as taught by Nelson *et al.* ('203) in the process of Nelson *et al.* ('509) in view of Castanie *et al.* ('889) because, Nelson *et al.* ('203) specifically teach that simultaneously heating the mold and expanding the core has the effect of working and kneading the preform outwards against the walls of the mold cavity, hence providing for an improved molded product without wrinkles.

In regard to claim 3, Nelson *et al.* ('509) in view of Castanie *et al.* ('889) do not teach cooling of the mold. Nelson *et al.* ('203) teach that that removing the molded object after the mold has been cooled is an equivalent alternative to removing the molded object from the mold when the mold is still hot (see col. 25, lines 27-29). Therefore, it would have been obvious for one of ordinary skill in the art to have cooled the mold first before removing the molded article

as taught by Nelson *et al.* ('203) in the process of Nelson *et al.* ('509) in view of Castanie *et al.* ('889) because, Nelson *et al.* ('203) specifically teach that removing the molded object after the mold has been cooled is an equivalent alternative to removing the molded object from the mold when the mold is still hot and also because, by removing the molded object after cooling the mold safety requirements are less stringent and work accidents are less likely to occur. Further, it should be noted that Nelson *et al.* ('509) teach a mold having cooling lines (see col. 15, lines 47-48), hence suggesting cooling of the mold.

Specifically regarding claims 7-8, Nelson *et al.* ('509) in view of Castanie *et al.* ('889) do not teach a specific molding time. However, Nelson *et al.* ('509) teach that the pressure time, the amount of pressure and the time and extent (mold temperature) of the heating of the mold are process variables that are optimized. Hence, it is submitted that the heating time is a result-effective variable because it is optimized and also because it determines the curing of the resin (see col. 15, lines 26-38). In re Anonie, 559F.2d 618, 195 USPQ 6 (CCPA 1977). Further, Nelson *et al.* ('203) teach a heating time of 10 minutes for curing an epoxy resin (see col. 19, line 49). Regarding claim 7, it would have been obvious for one of ordinary skill in the art to have used a heating time of 10 minutes as taught by Nelson *et al.* ('203) in the process of Nelson *et al.* ('509) in view of Castanie *et al.* ('889) because, Nelson *et al.* ('203) specifically teaches that a heating time of 10 minutes cures an epoxy resin, whereas Nelson *et al.* ('509) in view of Castanie *et al.* ('889) teach curing of an epoxy resin. Regarding claim 8, it would have been obvious for one of ordinary skill in the art to have used routine experimentation to determine an optimum heating time ranging from 30 minutes to 3 hours in the process of Nelson *et al.* ('509) in view of Castanie *et al.* ('889) and in further view of Nelson *et al.* ('203) because, Nelson *et al.*

('509) specifically teach that the heating time is a result-effective variable and also because the heating time is determined by the type of resin used.

Allowable Subject Matter

13. Claims 41-44 are allowed.

14. Claims 13-16 objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Response to Arguments

15. Applicant's remarks filed September 17, 2003 (Paper No. 10) have been considered.

Applicant argues that that "combination that teaches usable and reusable cores is improper" (see page 13 of the amendment filed September 17, 2003). In response, it should be noted that:

(a) arguments drawn to the newly added limitation of a "inner reusable body" have been addressed in this Office Action as set forth above;

(b) although the teachings of Castanie *et al.* ('889) and Nelson *et al.* ('203) appear to teach a "reusable" and respectively, a "usable" core, actually all references teach "reusable cores." Specifically, Castanie *et al.* ('889) teach a reusable core and a usable sheath, whereas Nelson *et al.* ('203) teach a reusable sheath and a usable core, hence both references have at least one "reusable" element. Further, it should be noted that one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references.

See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). Further, it should be noted that in view of the newly added limitation of a "inner reusable body," the teachings of Nelson *et al.* ('203) were used to merely show that a bicycle connector element is a hollow composite article, whereas Castanie *et al.* ('889 B1) teach a more efficient process for forming any hollow composite article by producing accurate internal surfaces. Furthermore, it should be noted that Castanie *et al.* ('889 B1) specifically teach that having a reusable metallic inner core is an improvement over a destructible core (as taught by Nelson *et al.* ('203)) because accurate surface features can be molded (see col. 2, lines 34-43).

Applicant argues that JP 57-210820 does not teach "arranging an expandable core having a reusable inner body" (see page 14 of the amendment filed September 17, 2003). However, JP 57-210820 teaches an expandable mold having a main body (4) (reusable inner body) and a plurality of movable sectors (3), applying a plurality of resin pre-impregnated fiber reinforced plies (1) about said expandable sectors (3) to form a wrapped assembly, expanding said expandable sectors (3), curing said resin pre-impregnated fiber reinforced plies (1) and removing said expandable mandrel (10) (including the reusable inner body) so as to obtain a hollow tube (see Abstract).

Applicant argues that because "the cores in Nelson '509 and Castanie are not reusable...Castanie has a clear teaching away from nelson '509" (see page 14 of the amendment filed September 17, 2003). In response, it is noted that Castanie *et al.* ('889) teach a reusable core and a usable sheath, whereas Nelson *et al.* ('203) teach a reusable sheath and a usable core, hence both references have at least one "reusable" element. Further, it should be noted that

Castanie *et al.* ('889 B1) specifically teach that having a reusable metallic inner core is an improvement over a destructible core (as taught by Nelson *et al.* ('203)) because accurate surface features can be molded (see col. 2, lines 34-43).

Under MPEP §2144, the "reason or motivation to modify the reference may often suggest what the inventor has done, but for a different purpose or to solve a different problem. It is not necessary that the prior art suggest the combination to achieve the same advantage or result discovered by applicant." In re Linter, 458 F.2d 1013, 173 USPQ 560 (CCPA 1972). As such, in view of the newly added limitation of a "inner reusable body," the teachings of Nelson *et al.* ('203) were used to merely show that a bicycle connector element is a hollow composite article, whereas Castanie *et al.* ('889 B1) teach a more efficient process for forming any hollow composite article by producing accurate internal surfaces.

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

16. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stefan Staicovici, Ph.D. whose telephone number is (703) 305-0396 (until December 22, 2003) and (571) 272-1208 (after December 23, 2003). The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM and alternate Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael P. Colaianni, can be reached at (703) 305-5493. The fax phone number for this Group is (703) 305-7718.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

Stefan Staicovici, PhD

Stefan Staicovici

Primary Examiner 12/1/03

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December 1, 2003